



Saving Nemo – Reducing mortality rates of wild-caught ornamental fish

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Although the films *Finding Nemo* and *Finding Dory* introduced millions of viewers to the beauty of saltwater fish, Nemo, Dory and many of their friends might literally end up down the drain.

The Best Alternatives Campaign estimates that in the Philippines, as much as 98% of wild-caught marine ornamental fish die within one year of capture.

Due to current capture, transport and shipping practices, about 80% of all marine fish die even before they are sold to hobbyists. As much as 90% of all ornamental marine fish that are sold die within the first year. Only the hardiest – clownfish, damselfish, wrasses, gobies and blennies – or those lucky enough to be bought by elite hobbyists with more know-how, survive beyond their first year in captivity.

Trade in living jewels

Three basic types of fish are kept as pets: 1) saltwater fish from the sea, 2) freshwater fish from rivers or lakes, and 3) brackish water fish from zones where fresh and saltwater mix. Because of the extreme fluctuations in water flow and the amount of silt in rivers throughout the year, most fresh and brackish water fish have learned to adapt to dramatic environmental changes..

Freshwater fish can, for example, rapidly adapt to waters that during monsoon rains engorge rivers with mud and silt. In contrast, brightly hued saltwater or marine fish live in the single most stable environment on Earth – the ocean – where large-scale changes occur not over days, but over



Figure 1. A shop attendant dutifully inspects a holding tank of brightly hued butterflyfish, angelfish and surgeonfish. Despite the hopeful efforts of many hobbyists, most of the fish will die within a year (photo by Gregg Yan/Best Alternatives Campaign).

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millennia. Because of this, most marine fish species are unprepared for life in the average home aquarium, where water parameters fluctuate daily.

In the 1970s, the development of new technologies such as canister filters, ultraviolet sterilizers, protein skimmers and artificial sea salt finally allowed hobbyists to keep the sea's living jewels. By 1992, the annual trade in marine ornamentals soared to USD 360 million, involving 36 million fish. Today the trade is valued at more than USD 1 billion, with 40 nations supplying some 2,000 marine fish species and 650 marine invertebrate species to a host of countries, primarily the United States (which imports half the world's marine ornamental fish), Japan and western Europe.

Today, the Philippines and Indonesia remain the world's top exporters of wild marine fish and invertebrates, supplying about 85% of the global demand. In 1998, the Philippines exported an estimated USD 6.4 million worth of marine aquarium fish and invertebrates, slightly buoying the lives and livelihoods of around 4,000 collectors based throughout the country.

However, 40 years of lightly regulated collection compounded by cyanide use has decimated many reefs. In many fish collection sites, high-value ornamentals such as emperor angelfish (*Pomacanthus imperator*) and clown triggerfish (*Balistoides conspicillum*) are conspicuously absent. Since *Finding Nemo* premiered, soaring demand caused clownfish populations to plunge by as much as 75% in some areas (Fig. 2).

Steps to a sustainable trade

The vast majority of wild-caught ornamental marine fish are taken from coral reefs. A 1994 study found that only 5% of the Philippines' coral reefs were in excellent condition (Gomez et al. 1994).

Under a system pioneered by Filipino scientists Ed Gomez and Angel Alcala (1981)², coral reefs with less than 25% hard coral cover are considered to be in poor condition, those with 25–50% are classified as being in fair condition, those with 50–75% are considered to be in good condition, and those



Figure 2. In the five years since *Finding Nemo* first aired, rising demand in the marine aquarium trade has forced some clownfish populations to decline by as much as 75% (photo by Gregg Yan/ Best Alternatives Campaign).

boasting more than 75% are considered to be in excellent condition.

A recurring issue is the use of sodium cyanide, thought to have originated in the Philippines in the 1950s. An efficient nerve toxin, cyanide is squirted into coral heads or rock crevices to stun hard-to-catch fish. Unfortunately, the mixture burns both corals and the vital organs of fish, resulting in the deaths of up to 75% of all living things exposed to it.

Regulated collection of aquarium fish and invertebrates using nets and not poisons, better stocking and shipping techniques, plus imposing sensible size, catch and species limits can provide collectors both sustainable livelihoods and a strong incentive to protect instead of exploit coral reefs.

In the Pacific Island nations of Fiji, Tonga and the Solomon Islands, local communities are learning to sustainably farm hard and soft corals, giant clams and live rock (compacted corals or reef rock encrusted with marine life) for export to western markets. Community members physically watch over plots where the high-value invertebrates are farmed, thereby providing a layer of protection from blast fishers and poachers.

The Best Alternatives Campaign was established in 2014 to promote a shift from threatened seafood and ornamental fish to more sustainable alternatives, thereby allowing dwindling stocks breathing room to recover. Simple solutions to transform the trade include the following:

1. **Hobbyists should avoid purchasing hard-to-keep fish**, especially cleaner wrasses (Fig. 4), Moorish idols (Fig. 5), mandarin fish (Fig. 6), and all types of seahorses (Fig. 7), which are protected under the Convention on International Trade in Endangered Species of Wild Fauna and Flora. Unless kept by specialists or scientists, captive mortality rates for these fish are estimated at 99% so it is best to avoid them entirely. By convincing hobbyists to steer clear of these types of fish in favor of hardier fish, alarming mortality rates for captive marine fish would be reduced.
2. **Hobbyists should shift to keeping hardy fish.** Many of the world's most beautiful aquaria feature hardy but still colorful clownfish, damselfish, gobies, wrasses and surgeonfish. Survival rates are far better with these species and hobbyists spend much less for upkeep and stock replacement.
3. **Hobbyists should shift to keeping artificial corals and invertebrates.** Unless armed with cutting-edge equipment and a bottomless bank account, the Best Alternatives Campaign recommends that hobbyists steer clear of all stationary invertebrates such as corals, sponges and sea anemones. Because their care is dramatically more complex than already difficult-to-keep reef fish, captive mortality rates are staggering. Moreover, harvesting wild hard corals for both the pet and curio trades is illegal in the Philippines. If tank-raised corals are unavailable, then artificial corals or reef blocks are excellent alternatives. They will last decades and require only occasional cleaning.
4. **Hobbyists should shift to aquacultured fish and invertebrates.** In stark contrast to freshwater aquarium fish, 95% of all marine ornamental fish and invertebrates are wild-caught. Fortunately, the Philippines Bureau of Fisheries and Aquatic Resources recently approved a programme whereby fish farmers can apply for wildlife ranching permits, allowing them to collect a specified number of wild individuals as broodstock for inland rearing facilities. In exchange, 30% of the reared juveniles must be released back into the wild. Farmed seahorses and clownfish are already popular in western countries.



Figure 3. The end of the line. As many as 98 out of every 100 wild-caught marine ornamental fish die within one year. "Marine fish are not expendable décor. They have lives and important ecological roles to play in coral reefs," explains veteran aquarist Joseph Uy. The Best Alternatives Campaign works to minimize alarming mortality rates for marine fish and invertebrates (photo by Gregg Yan/Best Alternatives Campaign).



Figure 4. Once a common sight on Philippine coral reefs, cleaner wrasses perform an important service by picking reef fish clean of parasites, sometimes swimming into the gaping jaws of large predators to clean their teeth. Unfortunately, their extremely specialized diet makes them difficult aquarium inhabitants. They are best left in the wild (photo by Gregg Yan/Best Alternatives Campaign).

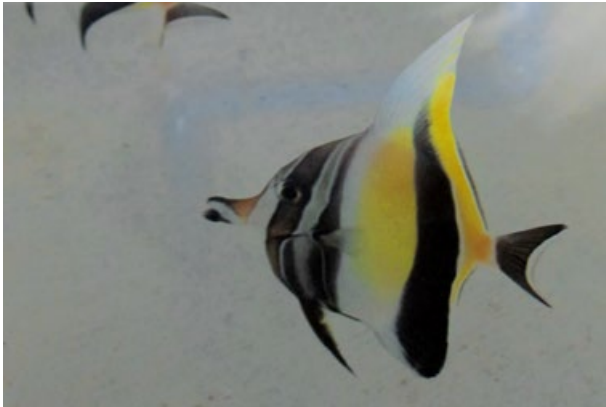


Figure 5. Despite being one of the most iconic marine fish, “Gil” (a Moorish idol) from *Finding Nemo* rarely eats in captivity and almost always succumbs to a slow death. Sadly, it remains one of the trade’s most common offerings (photo by Gregg Yan/Best Alternatives Campaign).



Figure 6. Possibly the world’s most colorful fish, mandarinfish take poorly to captivity and are usually overpowered by more aggressive tank mates (photo by Gregg Yan/Best Alternatives Campaign).



Figure 7. Specialist feeders, all seahorse species are difficult to keep. Mortality rates are estimated to breach 90%. Certified Philippine tank-raised seahorses are good alternatives (photo by Gregg Yan / Best Alternatives Campaign).

- 5. Suppliers should raise the prices of marine ornamental fish and invertebrates.** Higher prices limit the hobby to those with the financial resources to keep the animals alive. Aside from curbing volume-based trade, higher prices would translate to better incomes for local fishermen, who would in turn earn more from catching fewer fish.

The marine aquarium trade certainly has its merits. A growing list of fish can now be cultured not just for profit, but someday might help restock Earth’s denuded reefs. More importantly, the hobby cultivates a love and understanding of nature and its myriad processes.

Replacing delicate marine fish and invertebrates with hardy, or even aquacultured alternatives, will reduce captive mortality rates, which is a good step toward making the billion-dollar ornamental marine fish and invertebrate trade more sustainable.

For more information on the Best Alternatives Campaign, please contact Gregg Yan on Facebook.

References

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- Gomez E.D., Aliño P.M., Yap H.T. and Licuanan W.Y. 1994. A review of the status of Philippine reefs. *Marine Pollution Bulletin*: 29(1–3):62–68.



Figure 8. A copperband butterflyfish is pressed against the glass for assessment at a marine fish export facility in Manila (photo by Gregg Yan/Best Alternatives Campaign).



Figure 9. Marine fish form a swirling melee of color inside an aquarium in Cartimar, Manila (photo by Gregg Yan/Best Alternatives Campaign).